**Homework: Questions from reading: “Introduction to Chemistry”**

1.Ozone is important because it absorbs most of the ultraviolet radiation before it reaches the Earth’s surface. This makes sit possible for living things to exist on Earth.

2. Ozone is formed in the upper regions of the stratosphere where oxygen gas is exposed to ultraviolet radiation.

3. CFCs (chlorofluorocarbons) are laboratory made chemicals consisting of chlorine, fluorine and carbon and they are used as coolants in refrigerators and air-conditioning units, propellants in spray cans and in plastic foams.

4.Ozone is formed when oxygen gas is exposed to ultraviolet radiation and as the equator receives the strongest of the sun’s rays it leads to ozone being formed in this region.

5.In general the graph shows ozone levels in the atmosphere declining over time.

6. Matter is anything that takes up space and has mass.

7. Both mass and weight are measurements of the amount of matter, however they are not the same as weight is more a measurement of Earth’s gravitational pull on that matter whereas mass is just the measurement of the amount of matter.

8. Chemistry involves the study of changes at a submicroscopic level because it helps to understand what causes changes seen at a macroscopic level. For example, at macroscopic level, you will notice that a leaf is green but if you only look at it at a macroscopic level you may never understand what makes that leaf green and why it is so. This is where chemistry comes in, chemistry allows us to dig deeper and to learn about what goes on beneath the surface of this leaf, it allows us to discover what reactions are occurring and what influences the colour of the leaf.

9.When synthesizing new chemicals with potential uses scientists must be very cautious as it could have many other effects and reactions to everything around us. This was seen in the case of CFCs, at first they seemed very useful and did not react to other chemicals but over time they caused ozone levels in the atmosphere to decrease. So, for any new chemical that is synthesized it is very difficult to predict what will happen and what effect it may have, therefore scientists need to be very cautious.

10. If weight is 120 pounds and mass is 54 kilograms then on the moon my mass would be the same (54 kilograms) and my weight would be 1/6 of that on Earth. This is because mass will not change whereas weight, which is basically a measurement of gravity’s pull will change. Therefore, as the moon’s gravitational force is 1/6 of Earths, my weight would be 20 pounds and my mass would be 54 kilograms

11. The scientific method is an organized process by which scientists do research and are able to verify the work of others. The steps vary from scientist to scientist but in general they are, observation, hypothesis, experiment and conclusion.

12.The independent variable would be the temperature as that is what you are putting in to the experiment. The dependent variable would be the size of the balloon and the constant would be the amount of air in the balloon. A control would have to be constructed and could be done by filling the balloon with air at room temperature and measuring it’s volume. Then it could be heated or cooled and the volume compared to that of the room temperature balloon.

13. Molina and Rowland’s hypothesis is strong in that there is evidence showing ozone levels decreasing while CFCs rise however it does have it’s weakness as well. As they are referring to ozone and CFC levels in the atmosphere it is difficult to say that there is a direct correlation between the two. This is because there are many other elements and chemicals present in the atmosphere which could have led to ozone levels decreasing. Or it could even be a natural process for ozone levels to vary just as temperatures on Earth have, moving from ice ages to heat waves and so forth. So, while there is evidence to suggest that their hypothesis is correct there are also other factors that weaken their hypothesis.

14.It should be a law because the gases will never change; therefore a certain temperature will always have the same effect on the volume of the gases at constant pressure. If gases were to change their properties or how they react to certain variables such as temperature then it would not be a law, but seeing as gases will always be what they are (oxygen will always be oxygen, helium will always be helium… etc.) and will always react in the same way that they do now then Charles’s description would be called Charles’s law.

15. Molina and Rowland’s data in the lab must be supported by measurements take in the stratosphere because the data collected in the lab will have been more controlled than that in the stratosphere. Therefore, the data in the lab could have had a completely different outcome to what the stratosphere data suggests; it could have been that under controlled circumstances CFCs do not impact ozone levels but in the stratosphere the more CFCs there are the less ozone there is. So data must be collected from both sources in order to see if there is a correlation between the two, which could be crucial in either supporting or rejecting their hypothesis. Also to prove a hypothesis they would have needed to collect as much data as they could to ensure an accurate conclusion.

16.It would be considered a hypothesis because if no data is provided then there is no evidence that it is true or even that it has been tested. For it to be a conclusion it would need data to support it so as there is no data it must be a hypothesis.